

to attain a larger size in our own seas than in the south of Europe: viz., *Murex corallinus*, *Lachesis minima*, *Rissoa striatula*, *Donax politus*, *Avicula Tarentina*, *Galeomma Turtoni*, and *Trochus striatus*. These are, according to the late Professor Edward Forbes, some of the principal representatives of the "Lusitanian" type.

To these may be added species of *Artemis*, *Cylichna*, *Mactra*, *Mangelia*, *Nassa*, *Natica*, *Neera*, *Pecten*, *Pectunculus*, *Syndosmya*, *Tapes*, *Tellina*, *Tornatella*, *Trochus*, *Turritella*, *Venus*, and probably of every other genus which is common to the European seas.

I have purposely omitted any of the species which Mr. M'Andrew may consider as "Arctic," "Boreal," or "Celtic," although I apprehend such geographical distinctions have no foundation in fact or in nature.

The difference between Mr. M'Andrew and myself (or the error into which one of us has fallen) may have arisen from our respective collections being better furnished with specimens of the shells which each has had greater opportunities of procuring; and it is to be hoped that further experience will show which of our conclusions is correct.

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XXIII.—*On the Tribe Colletieæ, with some Observations on the Structure of the Seed in the Family of the Rhamnaceæ.* By JOHN MIERS, F.R.S., F.L.S. &c.

[Continued from p. 95.]

In regard to the general structure of the flower in the *Colletieæ*, there is little to add beyond what we find recorded on the subject; but it may be remarked that the lobes of the calycine border in that tribe, as in others of the *Rhamnaceæ*, have a prominent keel along the middle of their internal face, which terminates below the apex in an elevated callous gland, connected with two other raised lines that run along the border. These medial keels and glands have been supposed by some to be so many sterile stamens; but Brongniart, with more truth, considers their appearance to be the result of the impression left upon the soft fleshy lobes of the calyx, while in æstivation, by the indentation of the enclosed petals and stamens: that such is the real cause, is shown in the instance of *Gouania*, where a similar carinal prominence exists in the calycine lobes, and, in addition, at the base of each keel is seen an acute scale, which is really the rudiment of an abortive stamen. Similar impressions are frequent in many other families where the floral envelopes have a valvate æstivation. We meet with another point of structure in the *Colletieæ*, which, as far as I am aware, has not been noticed by botanists: I refer to the peculiar deve-

lopment of the stipules. Brongniart, who enters fully into detail respecting the several parts of the plant in the *Rhamnaceæ*, in describing their stipules, does not allude to it; he even states that these organs are entirely wanting in *Retanilla*, where I find this development to be a very characteristic feature. Beneath each spine and at the base of each petiole, a dark red-coloured broad scale is seen, which somewhat embraces the stem; it is concave, and terminates at the apex in two short teeth, or lengthened erect linear segments, the petiole appearing to spring from between them: in some instances, as in *Colletia*, *Talguenea*, *Trevoa*, *Adolphia*, and *Scypharia*, these stipular scales are simply amplexicaul; but in other cases, as in *Notophaena*, *Retanilla*, *Ochetophila*, and *Discaria*, those of the opposite axils unite in a short vaginal sheath, forming a dark transverse line around the stem, making each node seem to be articulated, as in *Ephedra*. Between each scale and its corresponding spine, a tubercular swelling originates, upon which both leaves and flowers appear, when, as frequently occurs, they are fasciculated: this tubercle is, in fact, a suppressed or undeveloped branchlet; the scales are the opposite stipules of the approximated decussating axils, some of which are sterile, while others produce both leaves and flowers, or each separately. This feature affords a very good discriminating character in some of the genera.

After these prefatory remarks, I proceed to the consideration, in succession, of the several genera of the *Colletieæ*, separating the tribe into three divisions:—1, where the petals are wanting, and the fruit is separable into distinct cocci; 2, where petals are present, with a similar fruit; 3, where petals are also present, but where the fruit is indehiscent.

Division 1. *Eucolletieæ*. Flores apetalæ; fructus capsularis, dehiscens.

### 1. COLLETIA.

A very good history of this genus is given by Sir W. Hooker in his 'Botanical Miscellany' (i. p. 150), but some confusion has existed among its species, which I have endeavoured to clear away. The species are mostly confined within the extratropical regions of South America, on both coasts; some few have been found within the tropics, one of them by Humboldt, at Huanca-bamba, in Upper Peru, at an elevation of more than 10,300 feet above the sea. The greater portion are met with near the base of the Andes, both on the western and eastern sides, at an elevation of from 2500 to 6000 feet, while others are seen only on the maritime sandhills along the coasts of Chile and in the low grounds bordering the river Plate. Commerson's plant, said by Jussieu to be from Brazil, is from the province of

Buenos Ayres: one species is a native of the island of Juan Fernandez, in the Pacific. The genus is readily distinguished from most others of the *Colletieæ* by the absence of petals,—a character partaken of only by one other, which I have proposed under the name of *Notophaena*, from which it is at once recognized by the peculiar form of its disk. In many genera of the tribe the tube of the calyx is circumscissile in the line of its contraction above the basilar intumescence; *Colletia* differs from them in having its circumscissile zone midway between that line and the base, so that when the tube falls away, it carries with it its annular disk, and when seen from below, it seems closed by a diaphragm, pervious only for the passage of the style. When the fruit is half immersed in the persistent cupular base of the calyx, its epicarp forms a loose skin, which breaks round the margin of the cup, leaving its lower moiety persistent within it, while the upper moiety splits at the same time, to allow the separation of the three cocci (consisting of endocarp), which spring out of the calycine cup with elastic force, each coccus bursting by its axial line, as in *Euphorbiaceæ*, &c.; the remaining portion of the epicarp attached to the cocci comes off like a loose skin; but the mesocarp, which is membranaceous, adheres to the corneous endocarp.

COLLETIA, Comm.—Char. emend. *Calyx* cylindricus vel urceolato-tubulosus, imo tumescens et hinc demum circumscissus, 8–10-striatus, limbo 4–5-fido, laciniis acutis reflexis, intus carina prominula calloque apicali notatis, æstivatione valvatis. *Petala* nulla. *Stamina* 4 v. 5, inter lacinias calycis, rarius sub faucem, inserta; *filamenta* subulata, compressa, laciniis fere æqualia vel breviora, erecta, apice sæpe inflexa; *antheræ* sub-2-lobæ, reniformes, oscillatoriæ, transversim 2-valves, valva antica quam postica brevior, et rima hipocrepica late hiant. *Discus* imo tenuissimus aut fere evanidus, ibique ad fundum calycis adnatus, margine (in coarctationem tubi) libero latissimo et convolutim inflexo hinc valde conspicuus, carnosus, et annularis. *Ovarium* superum, globosum, 3-sulcatum, 3-loculare; *ovula* in loculis solitaria, e basi erecta. *Stylus* filiformis, calyci æquilongus. *Stigma* parvum, obtuse 3-lobum. *Fructus* siccus, subglobosus, 3-sulcatus, calycis cupula semi-immersus, subcapsularis, in coccus 3 solubilis, coccis crustaceis, rima ventrali elastice 2-valvatim dehiscentibus, monospermis. *Semen* erectum, ovatum, vix compressum, ventre subangulatum; *tunica externa* nitida, durissima, cornea, hilo basali pervio et transversali; *integumentum secundum* membranaceum, et medio substantia laxè cellulosa subcoriacea opaca ad priorem agglutinatum, raphigerum; *raphe* filiformis,

e basi lateraliter orta, hinc cursu omnino peripherico apicem transiens, et tunc altero latere ad hilum iterum regrediens; *integumentum internum* præcedenti laxatum, membranaceum, subopacum, a medio sensim arctatum, et imo in cerviculam filiformem brevem terminatum, *chalaza* majuscula carnosâ apicali munitum. *Embryo* intra *albumen* carnosum inclusus; *radicula* brevissima, infera, tereti, *cotyledonibus* carnosis foliaceis, planis, cordato-ovatis.—Suffrutices Americæ Meridionalis, plerumque extratropicales, intricato-ramosi, subaphylli, ramis decussatim, oppositis, divaricatis ramulis spinescentibus, spinis subulatis sæpe compressis, interdum latissime expansis et decurrentibus; folia paucissima, minuta, sæpe rudimentaria, opposita, integra; flores infra spinas orti, albidi vel albidorozei, pedicellis 1-floris nutantibus.

1. *Colletia spinosa*, Lam. Illustr. ii. 90. tab. 129; Dict. Suppl. ii. 312; DC. Prodr. ii. 28.—*C. horrida*, Willd. i. 1113; Vent. Hort. Cels. 92.—*C. polyacantha*, Willd. in R. & Sch. v. 113.—*Rhamnus Yaquil*, Domb. MSS.;—spinosissima, ramulis spinisque compressis valde striatis, striis in ramulis spiraliter, in spinis recte parallelis, spinis validis, longiusculis, decussatis, subulatis, apice callo acutissimo rubro terminatis; foliis parvis, oblongo-ovatis, glaberrimis, integris, aut summum versus denticulatis, caducissimis, breviter petiolatis, infra spinas insertis; floribus solitariis, vel paucis fasciculatis e tuberculo sub spina ortis, pedunculis brevibus reflexis; calyce cylindrico, medio constricto, imo ampliore et subgloboso, limbi laciniis 5, reflexis, acutis, apice callo instructis, staminibus parvulis ore fere sessilibus, filamentis brevissimis deflexis.—Buenos Ayres:—v. s. in herb. Jussieu, in Mus. Paris (Commerson).

This species must be considered as the type of the genus which, according to Jussieu (Gen. Plant. p. 380, ann. 1789), was first proposed by Commerson for a plant of his collection, who, however, assigned to it no specific designation: its first name, *Colletia spinosa*, was given by Lamarck (in 1793), in his 'Illustr. Gen.' tab. 129. Willdenow (in 1798) published the same plant, the only species then known, under the name of *Colletia horrida*. Poiret (in 1811) first detailed the characters of the genus, and Ventenat, in the meantime, figured and described two other plants, which he referred to *Colletia*. Poiret states (Encycl. Meth. Suppl. ii. 312) that Lamarck figured his type from the plant brought from Peru by Jos. de Jussieu, and from Brazil (Buenos Ayres) by Commerson; but he evidently confounded two species together. I have seen the original specimens of these two plants, which are preserved in the Jussieuan Herbarium, and fastened on the same sheet. Commerson's specimen

above described appears to be that figured by Lamarck as *Colletia spinosa*; Jussieu's plant, of which there are two small specimens, one in flower, the other in seed, corresponds with another larger specimen collected also in Peru (Tarma) by Dombey, which I have described under the name of *C. aciculata*. Lamarck's figure, though coarsely drawn, is tolerably correct; but the spines in the specimen are longer than are there represented, and not at all curved. I have adopted from his description and plate the character of the leaves which are now wanting in the two existing specimens, both collected by Commerson in "Buenos Ayres," or at least in the Argentine Provinces. In the full-grown specimen, the spines are an inch long, and a line in diameter at the base; in the younger specimen, with the flowers in bud, the spines are somewhat shorter, more slender, and more terete; they are all of a dark green colour when dried. The leaves in Lamarck's figure are 4 lines long and 2 lines broad. The slender reflexed peduncles are about a line long; the tube of the calyx is 2-2½ lines long, 1½ line in diameter, its segments being 1 line long and ½ line broad\*.

2. *Colletia intricata*, n. sp.;—spinosissima, glaberrima, ramulis compressis, spinis longis, curvulis, spinulisque decussatis, teretibus, subulatis, apice callo acuto rubro pungentibus; foliis rarissimis, oppositis, oblongis, crassiusculis, obtusis, dentatis, 3-nerviis, imo in petiolum sublongum canaliculatum gradatim angustatis, e sinu dentium stipulæ minutæ enatis; floribus pro genere majusculis 2-3, fasciculatis, e tuberculo squamoso infra spinas prodeuntibus, nutantibus; calyce cylindrico, tubo amplo, 10-nervio, rubescente, imo carnosio, limbi laciniis 5 albis, reflexis; staminibus in sinibus subsessilibus, filamentis brevissimis.—In Andibus Mendocinis et Chilensibus:—circa Uspallatam (altit. 6000 ped.) et procul Mendoza (2600 ped.) mihi lecta;—v. s. in herb. Hook. in Andibus Mendozæ (Gillies);—Chile (Bridges), a Valparaiso missa, sed forsau in Andibus lecta. Vernac. *Yaquil*.

This differs from the typical species in its longer, more slender, and more terete, obsoletely striated spines, in its general glaucous hue, in the form of its leaves, which are denticulated, and more especially in its conspicuous and larger flowers. It forms a low, branching, spiny, and almost leafless shrub. Its decussating nodes are half an inch apart; its spines are opposite, from 7 to 15 lines long; the leaves are 3 lines long, 1½ line broad, upon a petiole of 1 line in length; the petiole is inserted in a sharp notch on the apex of a minute rigid stipular scale

\* A figure of this species, with analytical details, will be given in the 'Contributions to Botany,' plate 34 A.

beneath each spine, between which is seen the squamose tuft out of which the flowers spring. The flowers are of a deep rose colour, with a white reflexed border, and are larger than the other species of the genus; the pedicel is 2 lines long; the calyx is tubular, not contracted in the middle, fleshy at base, 3 lines long and 2 lines in diameter, the segments of the border being in addition 1 line long and  $\frac{3}{4}$  line broad\*.

3. *Colletia invicta*, n. sp.;—spinosissima, ramulis spinisque compressis, glauco-pruinosis, subflavis, et molliter puberulis, spinis 3-seriatim spinulosis, crebris, validis, intricatis, apice callo rubro pungentibus; foliis in ramulis novellis parvulis, ovatis, utrinque acutis, crassiusculis, enerviis, margine crenulatis, ubique puberulis, subreflexis, subimplicatis, fere epetiolatis, caducissimis, e stipula enatis; floribus majusculis, roseis, 4-6 e tuberculo squamoso infra spinas fasciculatis, nutantibus; calyce cylindrico, tubo amplo, 10-nervio, rubro, imo carnosio, disco basin versus annulari, limbi laciniis 5, carnosulis, pallidis, reflexis; staminibus in sinubus parvis, filamentis brevissimis, stylo exserto.—Chile?—v. s. in *Herb. Mus. Paris* (*sine designatione*).

This is very different in habit from the former, being of a deep yellow hue, somewhat pubescent, with much shorter and thicker spines and closer axils. The primary spines are  $1\frac{1}{2}$ -2 inches long, the secondary spines  $\frac{1}{2}$ - $\frac{3}{4}$  inch long, and 4 lines apart, and the tertiary spinelets are 3 to 4 lines long, all forming a dense entanglement; the leaves are channelled above, about 2 lines long, 1 line broad, tapering into an almost obsolete sulcated petiole; the pedicels are 2 lines long; the tube of the calyx is 3 lines, and the segments 1 line long: it is quite cylindrical, and 2 lines in diameter; the filaments are only  $\frac{1}{4}$  line in length, the anthers globose. The flowers much resemble those of the preceding species in size and form, but the annular disk is placed nearer the base of the tube; they are quite glabrous.

4. *Colletia ferox*, Gill. & Hook. Bot. Misc. i. 154. tab. 44 B;—implexo-spinosa, ramulis abbreviatis, aphyllis, viridibus, spinisque oppositis, subulatis, compressis, iterumque decussatim spinosis, substriatulis, pungentibus, hinc confertim intricatis; floribus rosaceis 2-3, fasciculatis, sub spinis e tuberculo squamoso ortis; pedunculo flore paulo brevior, calyce medio constricto, imo subgloboso, limbi laciniis 5, reflexis, staminibus 5 parvulis in fauce inter lacinias fere sessilibus; stylo exserto; fructu 3-lobo, subgloboso, cupula calycina

\* This species will be shown in the 'Contributions,' plate 34 B.

suffulto.—In *Andibus Chilensibus et Mendocinis*.—*v. s. in herb. Hook.* (Gillies, Cuming).

This species is very different in its general appearance from the three preceding, its spines being much shorter, very much entangled, of a dark colour; its flowers are smaller, and more contracted in the middle. The primary spines are 2–2½ inches long, the secondary are ½ to 1 inch, the tertiary spinelets are 2 to 4 lines; they are all quite glabrous. The pedicels are very slender, 2 lines long; the calyx, including the segments of its border, is 3 lines long and 1½ line in diameter in the mouth; the flowers are of a pale reddish-white colour, and of thin texture\*.

5. *Colletia atrox*, n. sp.—*Discaria Americana*, *Hook. in parte, Bot. Misc.* iii. 172;—horride spinosa, ramulis pallide olivaceis, striatulis, spinis elongatis, validissimis, crassis, secundariisque brevibus decussatim oppositis, glaberrimis, valde compressis, imo latis et hinc subdecurentibus, pallide viridibus, apice callosopungentibus, aphyllis aut foliis caducissimis; floribus majusculis, palidissimis, 2–8, fasciculatis, e tuberculo squamoso ad basin spinarum enatis; pedunculo flore paulo brevior, calyce late tubuloso, medio subconstricto, textura tenui, albido, imo inflato, limbi laciniis 5 revolutis; antheris parvulis, globosis, in ore fere sessilibus, stylo exserto, imo articulado, et mox caduco, ovario globoso, 3-lobo.—*Buenos Ayres*.—*v. s. in herb. Hook.* (Tweedie).

The strong and flattened spines of this plant give it a peculiar character, which indicates an approach to the following remarkable species. The branchlets are about 4 inches in length, the primary spines 1½ inch long, gradually diminishing upwards; their secondary spines, in one, two, or three almost horizontally salient decussating pairs, are from 3 to 6 lines long, much flattened and spreading at their base, where they are 2 lines broad and half a line thick, all armed with a reddish, sharp, callous point; they are of a greenish pallid hue. The flowers, in clustered fascicles, are nearly the size of those of *C. intricata*, and of the same pale colour; the tube is more globose at the base, and much contracted in the middle, 2½ lines long, the diameter of its mouth 1½ line, and the reflected segments 1 line in length: the slender peduncles are 2 lines long. This plant, by mistake, is confounded with *Discaria Americana* in the 'Botanical Miscellany' †.

\* A representation of this species will be given in the 'Contributions,' plate 34 c.

† A drawing of this plant will be given in the same work, pl. 34 d.

6. *Colletia cruciata*, Gill. & Hook. Bot. Misc. i. 52, tab. 43; ibid. iii. 172.—*C. Bictonensis*, Lindl. Journ. Hort. Soc. v. 29 cum icone.—*Condalia paradoxa*, Spr. Syst. i. 825;—suffruticosa, 3-4-pedalis, ramosa, ramulis subangulatis, spinis magnis, horridis, decussatim oppositis, valde compressis, latissime expansis, longe decurrentibus, et apice calloso-pungentibus ubique tectis; junioribus pilis incanis adpressis hirsutulis sparsim tomentellis, foliiferis; foliis perpaucis, cito caducis, ellipticis, dentatis, apice acutis et mucronatis, basi in petiolum brevem canaliculatum attenuatis, sub spinis e stipula 2-dentata enatis; floribus parvis 6-8, fasciculatis, e tuberculo squamoso tomentoso ad basin spinarum ortis, pedunculo flore brevior, calyce cylindrico, albo, basi viridi, medio non constricto, obscure 10-nervio, limbi laciniis 5 patentibus, staminibus 5 parvis fere sessilibus inter lacinias sitis, stigmatibus obsolete 3-lobis, incluso.—Banda Oriental.—v. s. in herb. Hook.—Maldonado (Gillies).

This plant was raised in England many years since, and then erroneously supposed to be a hybrid, or a monstrosity of *C. spinosa*, and was described by Dr. Lindley under the name of *C. Bictonensis*. It is the most remarkable species of the genus, on account of its monstrous spines, which are flattened, and extend from one axil to another in cruciating and divaricating pairs: they are nearly an inch long and 3 to 6 lines broad at their base. Its leaves are very caducous, oblong, acute, with a mucronate apex, more obtuse at the base, fleshy, obsolete 3-nerved, toothed on the margin, quite glabrous, 2 lines long, 1 line broad, on a slender petiole of 1 line in length; this springs out of a sinus of a bidentate acute stipule, also caducous. The flowers are smaller than in any of the preceding species, and are of a whitish colour: the length of the tube is  $1\frac{1}{2}$  line, of its reflected segments 1 line, its diameter 1 line. The annular perigynous disk is green, and situated near the base of the tube; the filaments are one-fourth of the length of the segments, and are reflected within the mouth; the style is exerted. The capsule is  $2\frac{1}{2}$  lines in diameter, 3-lobed, and seated in the free cupular persistent base of the calyx\*.

7. *Colletia Weddelliana*, n. sp.;—intricato-spinosa, ramulis nodosis versus compressis, ochraceo-vel glauco-pruinosis et granulato-punctatis, spinis teretibus, imo compressis, substriatis, iterumque spinulosis, apice glanduloso-pungentibus; foliis parvis, caducissimis, lanceolato-oblongis, utrinque acutis, integris vel summo dentatis, pallide glaucis, crassis, enerviis, convexis, rachi superne sulcata, inferne prominula, petiolo brevissimo,

\* This species will be represented in the 'Contributions,' plate 34 e.

canaliculato, deflexo; floribus paucis, fasciculatis, e tuberculo squamoso majusculo puberulo proficiscentibus; calyce cylindrico, 10-nervi, rubello, medio non constricto, imo carnosulo, limbi laciniis 5 reflexis, 3-nerviis, apice callosis, staminibus 5 in sinibus fere sessilibus, disco annulari crenulato, stylo incluso.—Bolivia, in locis aridis petrosis, Puna ad Lac. Titicaca, altit. 12,000 ped.—*v. s. in herb. Mus. Paris* (Weddell, 4391).

This species much resembles *C. atrox* in general aspect, but its spines are not so broad and compressed at their base, and are of a more glaucous-yellow hue; the form of the calyx corresponds more with that of *C. spinosa* in being broad and little constricted. The spines vary in length from 6 to 9 lines, are greatly divaricated or nearly patent, and are decussating, the internodes being 4 to 6 lines apart. The leaves are 3 lines long,  $1\frac{1}{4}$  line broad, thick, coriaceous, convex and channelled above, concave below, with revolute toothed margins; each pedicel is 1 line long; the length of the calyx (including its reflected segments, of nearly 1 line) is  $3\frac{1}{2}$  lines, and its diameter  $1\frac{1}{2}$  line\*.

8. *Colletia Kunthiana*. *C. spinosa*, *H. B. K. Gen. Sp.* vii. 59 (non Lam.).—Fruticosa, 1–2-orgyalis, ramosissima, et intricato-spinosa, ramulis obsolete striatis, fusco-brunneis, adpresse hirtellis, ad nodos compressis, spinis subbrevis, validis, subcurvulis, acumine callosopungentibus, junioribus foliiferis; foliis subsessilibus, parvulis, spathulato-lanceolatis vel obovatis, obtusis, integerrimis, concavis, infra carinatis, caducissimis, petiolo brevissimo, imo stipulis 2 ovatis minutis coadunatis instructo; floribus 1–4, fasciculatis, e tuberculo squamoso prodeuntibus; pedunculo flore pendulo brevior, calycis tubo rubescente tenuiter membranaceo, 10-nervio, basi tumido, limbi laciniis 5 acutis, reflexis, staminibus in sinibus fere sessilibus, stylo tereti, stigmatibus capitato-3-lobis, paulo exserto; capsula sub-3-loba, 3-cocca, cupula calycina, grandefacta, immersa, pisi magnitudine.—Huancabamba Altæ Peruvix, altit. 10,300 ped.—Vernac. *Zarza de Moyse*.—*v. s. in herb. Mus. Paris* (Bonpland) a cel. Kunthii missa.

This species has a fuscous hue, with short interlaced spinelets: the primary spines are 2 inches long; the secondary 8–10 lines, and 5 lines apart; the tertiary spinelets are 3 lines long, very stout, with a sharp point. The leaves are very caducous, and are wanting in the specimen I have seen, but they are described by Kunth. The flowers are small, of a reddish hue, many of them appear sterile, and soon fall off; the segments of the border are nearly as long as the tube, each being about 1 line long; and

\* A drawing of this plant will be given in the 'Contributions,' plate 34 f.

the tube is cylindrical, 1 line in diameter; the disk is seated near its base: the pedicel is only  $\frac{3}{4}$  line long in the flower, and 2 lines in fruit. The 3-lobed capsule, supported on the cupular remnant of the calyx, is  $2\frac{1}{2}$  lines in diameter\*.

9. *Colletia tenuicula*, n. sp.;—fruticosa, ramis teretibus, striatis, pallide olivaceis, pubescentibus, ramulis tenuibus, divergentibus, spinosis, spinis decussatim oppositis, acicularibus, simplicibus, nonnullis inferioribus iterum 2-spinulosis; foliis parvulis e ramulo novello inermi infra spinam enato, et ea dimidio brevioribus, crebriter approximatis et quasi fasciculatis; floribus 2–4 fasciculatis, infra spinas protensis, parvulis, pedicellisque gracilibus, glabris, erectis; calycis tubo rubescente infundibuliformi, tenuiter cylindraceo, imo globosim inflato, ore ampliore, limbi laciniis 5 acutis, revolutis; staminibus inter lacinias fere sessilibus, antheris parvis, globosis; ovario subgloboso, 3-sulcato, stylo filiformi, paulo exserto.—Patria ignota (forsan Buenos Ayres).—*v. s. in herb. Mus. Soc. Linn. ex herb. Linn. fil. cum indicio* “Cavanilles 1803.”

This is a delicate and slender species. The specimen above quoted is a mere fragment, 6 or 8 inches in length, originally contributed by Cavanilles to the younger Linnæus, whose herbarium passed into that of Sir Jas. Smith (now the property of the Linnæan Society). In habit it greatly resembles some of the species of *Discaria*, for which, at first sight, it might be mistaken. Its primary spines are very slender, almost acicular, of a pale green colour, pubescent, and about 2 inches long; the secondary spines, still more slender, are from 4 to 9 lines in length; the tertiary spinelets are only a line long: its filiform peduncles are  $1\frac{1}{2}$  line long, the very slender tube of the calyx, including the segments, is 2 lines long, the tube being  $\frac{1}{3}$  line in diameter†.

10. *Colletia pungens*, n. sp. *C. spinosa*, *Hook. in parte, Bot. Misc. i. 154. tab. 44 A (non Lam.)*; *ibid. iii. 173*;—ramis ramulisque glaberrimis, pallide glaucis, aphyllis, aut foliis caducissimis, ad nodos compressis, horride spinosis, spinis longis, validis, divaricatis, decussatim oppositis, subulatis, striatis, apice callo rubro pungentibus: floribus parvis, binis, vel pluribus fasciculatis, e tuberculo squamoso tomentoso infra spinam vel interdum e medio spinarum ortis, pedunculo glaberrimo flore brevioribus, calycis tubo longiuscule cylindraceo, imo globose ampliato, limbi laciniis 4–5, acutis, reflexis, staminibus totidem sinibus insertis, filamentis longiusculis, exsertis, erectis, laciniis paulo brevioribus, antheris parvis, viridibus, stylo longe exserto.—In Andibus Chilensibus.—

\* This species will be shown in the ‘Contributions,’ plate 35 A.

† A representation of this will be seen in the same work, plate 35 B.

*v. s. in herb. Hook.* La Guardia (Gillies); Mendosam versus (Gillies): Chile (Meyen); *in herb. Mus. Paris* (Gay, 2).

The general habit and appearance of this plant is like that of *C. spinosa*, Lam., but its flowers are much smaller, its stamens much longer, and ostensibly exerted: its armature is stouter, the primary spines are about 2 inches long, the secondary ones 6 to 9 lines long, diminishing upwards, and 4 to 5 lines apart; the flowers are numerous, frequently as many as eight from each spine: the pedicels are slender, 2 lines long; the length of the tube is  $1\frac{3}{4}$  line, and of the segments 1 line, its diameter half a line; the filaments are erect, half the length of the segments; the style is exerted, and is deeply bullated or torulose all over its surface\*.

11. *Colletia Spartioides*, Bert. Ann. Sc. Nat. xxi. 347; Hook. Bot. Misc. iii. 173; Colla, Mem. Torin. 37. p. 52. tab. 6;—sub-2-orgyalis, ramosissima, ramis virgatis, ramulis gracilibus, flexuosis, spinosis, junioribus sicco viridibus, pubescentibus, adultis glaberrimis, pallide glaucis, spinis subsparsis, decussatim oppositis, curvulis, compressis, longissimis, gracillimis, striatis, intricatis, apice pungentibus; foliis oppositis, spathulato-oblongis, basi attenuatis, margine serrulatis, obsolete 3-nerviis, glabris, petiolatis, e retinacula stipulari infraspinali breviter divaricata fusco-rubra 2-dentata ortis; floribus paucis, glomeratis, sub spinis enatis, pedunculo flore brevior, calyce breviter cylindraco, imo globosim inflato, limbi laciniis 5 acutis, revolutis, staminibus erectis, laciniis dimidio brevioribus.—Insula Juan Fernandez.—*v. s. in herb. meo et in herb. Mus. Paris* (Guillemin, Bertero); in *hb. Hook.* (Bertero, 1448; Cuming).

This species is remarkable for its broom-like habit and the branchlike length of its extremely slender and lax spines. Bertero describes it as a tree 8 or 10 feet in height, with whitish flowers of a rose-coloured tint, and as being almost bare of leaves: its leaves, however, are larger than in any other species, measuring 9 lines in length (including a petiole of 1 line) and  $2\frac{1}{2}$  lines broad. The pedicels are  $1\frac{1}{2}$  line long, the tube of the calyx 2 lines, the segments 1 line long, and the tube is  $1\frac{1}{2}$  line in diameter; the position of the disk is marked by a line of constriction above the semiglobose base of the calyx. The fruit, surmounted by the persistent style, is nearly globose, 2 lines in diameter, and supported by the lax persistent cup of the calyx †.

12. *Colletia cataphracta*, n. sp.;—intricatissime spinosa, fulvo-tomentella, aut parce pilosula, ramis elongatis, strictis, ramulis

\* A figure of this species will be given in the 'Contributions,' plate 35 c.

† This species will be shown in the same work, plate 35 d.

teretibus, ad nodos subcompressis, erectiusculis, spinis crebriter decussatis, nonnullis iterumque spinulosis, breviusculis, sulcato-striatis, pallidiusculis, apice calloso-pungentibus; foliis minusculis, ovatis, utrinque acutis, apice mucronatis, enerviis, glaberrimis, caducissimis, petiolo canaliculato, subreflexo, sub spina in sinu stipulæ minimæ rigidæ apice 2-dentatæ inserto: floribus plurimis, parvulis, fasciculatis, e tuberculo squamoso stipula suffulto enatis, pedunculo subbrevis, calycis tubo medio angustato, subinfundibuliformi, imo globosim inflato, limbi laciniis 5 revolutis, staminibus 5, laciniis æquilongis, erectis, stylo antheras parvas globosas attingente.—Chile meridionalis; *in herb. meo* (Miller).

This specimen was given to me by Dr. Miller, who I believe obtained it in the south of Chile, from the neighbourhood of Concepcion. Its main branch is perfectly straight, a foot in length from where it has been cut off, having evidently been longer; it is  $1\frac{1}{2}$  line in thickness: the primary nodes are  $1\frac{1}{2}$  inch distant, the secondary and tertiary 3 lines apart; the primary spines or branchlets are 1 to  $2\frac{1}{2}$  inches long, gradually decreasing upwards; the secondary spines are 9 lines, the tertiary 3 or 4 lines long, all terminated by a reddish corneous sharp point; the leaves, including the petiole, measure only a line in length, and  $\frac{1}{3}$  line in breadth; the flowers are small, and of a pale whitish colour; the peduncle is  $\frac{1}{2}$  line long, the tube of the calyx  $1\frac{1}{4}$  line in length, the segments  $\frac{1}{2}$  line long, the tube barely  $\frac{1}{2}$  line in diameter\*.

13. *Colletia armata*, n. sp.;—intricato-ramosa, ramulis subcompressis, sicco fusco-olivaceis, parce pubescentibus, spinosissimis, spinis elongatis, subpatentibus, striatis, iterumque longiuscule spinulosis, apice acute pungentibus: foliis utrinque glabris, ovatis, imo obtusis, aut vix acutis, remote dentatis, fortiter 3-nerviis, nervis supra sulcatis, petiolo brevi canaliculato reflexo, stipula rigida 2-dentata suffulto; floribus 2–5, e tuberculo stipula sustentato infra singulam spinam ortis, vel e medio spinæ nascentibus: pedunculo flore paulo brevior, calycis tubo late cylindrico, limbi laciniis 4–5, oblongis, acutis, reflexis, staminibus totidem, erectis, laciniis dimidio brevioribus, stylo vix exserto.—Chile.—*v. s. in herb. meo* (Bridges, 140); *in herb. Mus. Paris*, Valdivia (Gay, 49); Chile (Gay); Valparaiso (Gaudichaud, 1268); Monte La Leone (Bertero); Valdivia, Rio Callecalle (Lechler, 391).

The species is recognized by the unusual length and distance of its spines, which are somewhat curved, and not stout. The branchlets, in my specimen, are about 7 inches long, and barely a line in diameter: the primary spines are from 1 to 2 inches

\* This will be illustrated in the 'Contributions,' plate 35 E.

long, and about  $\frac{3}{4}$  inch apart; the secondary spines are from 7 to 10 lines long: the oblong leaves, with a toothed margin, are 3 to 5 lines long,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  lines broad, decurrent on a deeply channelled deflected petiole 1 line long; the nervures are sulcated on the upper surface, and prominent beneath: the flowers are small and pale, clustered together upon a large scaly tubercle; the pedicels are 1 line long, the tube, contracted for some length in the middle, is 2 lines, and its segments  $\frac{3}{4}$  line long; it is  $\frac{3}{4}$  line in diameter: the peduncle in fruit is thicker, 2 lines long, and the 3-lobed capsule is  $2\frac{1}{2}$  lines in diameter. In Bridges's and one of Bertero's specimens, the spines are much stouter and longer, much paler, yellowish, being  $1\frac{1}{2}$  to  $2\frac{1}{4}$  inches long, and a line or more in thickness, and they bear no spinelets, but two pairs of floriferous nodes upon each\*.

Var. *β. insularis*: spinosissima, spinis iterumque spinosis, validiusculis, striatis, foliis caducissimis; floribus 2-4 fasciculatis. —Insula Chiloë.—*v. s. in herb. meo et Hook.* (Capt. King).

This variety is very dissimilar in appearance to the foregoing, but has no tangible differential characters; it is of a darker olivaceous hue, and quite glabrous; the primary spines are 8 lines apart and  $1\frac{1}{2}$  to 2 inches long, the secondary spines 3 lines apart and 6 to 9 lines long; the pedicels  $1\frac{1}{2}$  line long, and the flowers are like those of the preceding.

14. *Colletia dumosa*, n. sp.;—suffruticosa, humilis, ramosissima, intricato-spinosa, fusco-viridis, ramulis tortuosis, teretibus, creberrime spinosis, parce pilosulis, spinis interdum ternatim verticillatis, iterumque spinulosis, spinulis oppositis, brevibus, teretibus, crassis, substriatis, imo et medio floriferis, apice callo glauco nitente pungentibus; foliis caducissimis, aut nullis; floribus albis 2-5, fasciculatis, glaberrimis, spinulis longioribus, e tuberculo squamoso ortis, fragrantibus, calyce pedunculo subæquilongo, imo tumido et 5-sulcato, medio constricto, limbi laciniis 5 acutis, reflexis, staminibus 5 laciniis fere æquilongis, erectis, antheris parvis, viridibus, stylo exserto, fructu 3-cocco.—Chile.—*v. v. ad Concon*, in dumetis arenosis maritimis frequens: vern. Junco.—*v. s. in herb. Mus. Paris*: Chile (Gay, sub *C. ferox*): Chile (Gay, sub *C. spinosa*): Chile boreali (Pöppig); in arenas humidis Talcahuano (Lechler, 2794).

The drawing and floral analysis I made of this plant thirty-five years ago are still preserved, but my specimens were lost by shipwreck. I have still many of its seeds, which enabled me to investigate the seminal structure given in a preceding page. The species is closely allied to *C. armata*, but differs in its much closer axils and much shorter spines; the floral pedicels are

\* A figure of this species will be given in the 'Contributions,' plate 35 r.

more elongated, and the stamens are longer and more exerted. The primary spines or branchlets are 2–3 inches long, the secondary spines are 8–10 lines long and 3 lines apart, the tertiary spinelets are 4–5 lines in length and 2 lines apart; the secondary spines, often opposite, are frequently ternate; the pedicels are 2 lines long; the tube of the calyx, which is cylindrical and somewhat swollen at base, is  $2\frac{1}{4}$  lines, and the segments  $1\frac{1}{2}$  line long and  $\frac{3}{4}$  line diameter; the filaments are erect, and  $\frac{3}{4}$  line long\*.

15. *Colletia veprecula*, n. sp. *C. spinosa*, var. *pubescenti-incana*, *Hook. Bot. Misc.* i. 154;—*suffruticosa*, *intricato-ramosissima*, *ramulis strictis, teretibus, pulverulentis, spinis oppositis, interdum ternis, crebre decussatim spinulosis, puberulis, spinulis brevibus, approximatis, striatulis, apice callo rubro nitente pungentibus; foliis parvulis, late obovatis, apice rotundis, emarginatis, et mucronulatis, utrinque pubescentibus, serrato-dentatis, a medio basin versus integris, et hinc in petiolum brevem canaliculatum cuneatis, in ramulis novellis præstantibus, cito caducis; floribus 4–6 fasciculatis, parvulis, e tuberculo albido-tomentoso ortis; calyce pedunculo æquilongo, tubo cylindræo, imo inflato, medio constricto, limbi laciniis 5 longiusculis, acutis, reflexis, staminibus laciniis dimidio brevioribus, erectis, stylo exserto stamina attingente.*—Chile.—*v. s. in herb. meo; Valdivia (Bridges, 141); Valparaiso (Cuming, 705);—in herb. Hook.; Concepcion (Beechey).*

This is a very distinct species, with stout and very straight branchlets, 8 to 18 inches long, or perhaps longer, quite terete, pruinose, or sparsely tomentose; the primary spines, frequently ternate and very spreading, are scarcely longer than the internodes, which, together with their very divaricate spinelets, give to the branches an interrupted spicate appearance. The ramal internodes are  $\frac{3}{4}$  inch apart, the primary spines are 1 inch long, the secondary spines are  $\frac{3}{4}$  inch long and 2 lines apart, and the tertiary spinelets are 2 to 3 lines long; the leaves are suborbicular, broadly emarginate at the summit, and mucronate with 2 or 3 teeth on each margin: the petiole is seated in the sinus of a bidentate stipule. The flowers are numerous, and densely aggregated, owing to the very close proximity of the axils, so that the entire branch appears a full-flowered spike: the pedicels are somewhat more than a line long, the cylindrical tube of the calyx is  $1\frac{1}{2}$  to 2 lines, and its segments  $\frac{3}{4}$  to 1 line in length, its diameter being  $\frac{1}{2}$  or  $\frac{3}{4}$  line: the flowers are pale and membranaceous†.

\* A drawing of this species, with analytical details of the structure of the seed, will be given in the 'Contributions,' plate 36 A.

† This plant will be represented in the same work, plate 36 B.

16. *Colletia aciculata*, n. sp.;—ramosissima, intricatissime spinulosa, viridis, breviter et rigide pilosula; ramis rectis, subteretibus, ramulis decussatis, crebre spinosis, spinis iteratim spinulosis, spinulis brevibus, sulcato-striatellis, acute pungentibus; foliis in ramulis novellis minimis, obovatis, paucidentatis, glabris, viridibus, imo in petiolum brevem cuneatis, caducis; floribus infra spinulas superiores fasciculatis, et hinc spicam cylindricam oblongam multifloram mentientibus, pedicello calyce brevior, calycis tubo late cylindrico, submembranaceo, imo inflato, carnosulo, limbi laciniis 5 acutis, subreflexis, staminibus 5 exsertis.—Peruvia: *v. s. in herb. Mus. Paris*, sine loco aut designatione, No. 901 (sub. nom. "Retama," Dombey); Tarma (Dombey, "vern. Naqui").

Three specimens of this plant exist in the Paris Museum: the first in flower, and the second in fruit, are in the Jusseuan herbarium, both upon the same sheet as the original typical species of *C. spinosa*; and these are probably the identical plants which Poirlet confounded together, in his description of the typical species, as being brought from Peru (Dict. Suppl. ii. 312): the third specimen was also collected by Dombey at Tarma. It has much the habit of the preceding species, but its branches assume the appearance of a broader and more spreading spike: they are of a pale olive hue: the branchlets are straight and cylindrical, the primary spines are about  $\frac{1}{2}$  inch apart and  $1\frac{3}{4}$  inch long; the secondary spines are 3 lines apart, and  $\frac{1}{2}$  to  $\frac{3}{4}$  inch long; the tertiary spinelets are 2 to 3 lines long, all being clothed with fine sparse down. The inflorescence, owing to the closeness of the axils, covers the branchlets, each appearing like a densely flowered spike; the pedicels are 2 lines long; the cylindrical calyx, but little swollen, though tumid at base, is  $2\frac{1}{2}$  lines, and the segments  $1\frac{1}{4}$  line long, and  $1\frac{1}{4}$  line diameter\*.

17. *Colletia hystrix*, Clos, in Gay, Chile, ii. 32;—ramulis teretibus, rectis, rigidis, fuscis, pubescentibus, spinis brevibus, compositis, 3-4-natis verticillatis, secus ramos valde approximatis, et hinc intricatone formam longam cylindricam mentientibus, aut interdum nodos globosos interruptis emulantibus, omnibus pilis rigidis patentissimis vestitis, et apice calloso-pungentibus; ramulis novellis inermibus, et foliiferis, demum spinosis et aphyllis: foliis parvis, ovatis, integris, aut obsolete dentatis, membranaceis subglabris, 3-nerviis, apice mucronulatis, imo in petiolum brevem attenuatis; floribus sparsis, subfasciculatis, pedunculo tenui, calyce sicco pallide

\* This species will be shown in the 'Contributions,' plate 36 c.

rosaceo, urceolato, medio constricto, imo globoso, limbi laciniis 5 reflexis, staminibus exsertis, filamentis erectis laciniarum quartam longitudinis, stylo filiformi, longe exserto, stigmate capitato-3-lobo.—Chile centralis. *v. s. in herb. Mus. Paris*;—versus pedem Andium (Gay).

This is a very distinct species, partaking much of the habit of the following, and somewhat of the two preceding. Dr. Clos remarks that, seen at a distance, its branches bear much the appearance of a *Cactus* or *Cereus*, owing to the length of its straight branchlets, and the extreme intricacy of its innumerable spines, and verticillated very short ramifications. The leaves are oval, rounded at the summit, cuneated at base into a short petiole: they are glabrous, toothed on the margins,  $2\frac{1}{2}$  lines long,  $1\frac{1}{2}$  line broad, on a petiole of  $\frac{1}{2}$  line; the flowers are small and few, the pedicel is  $1\frac{1}{2}$  line long, the tube of the calyx  $1\frac{1}{2}$  line, and the segments  $\frac{3}{4}$  line long, and it is 1 line in diameter, tumid and semiglobose at its base\*.

*Var. β. Valanzuelæ*; *Colletia Balanzuelæ, Bert. MSS.*: differt spinis acicularibus, tenuioribus, et paulo longioribus.

18. *Colletia ulicina*, Gill. et Hook, Bot. Misc. i. 155. tab. 44 c; *idem.* iii. 173;—suffruticosa, orgyalis, vel sub-2-orgyalis, ramosissima, ubique rigide hirsutula, ramis teretibus, elongatis, ramulisque spinosissimis, et intricatione spinarum quasi cylindræis, spinis duplo aut triplo spinulosis, aut oppositis, vel ternatim verticillatis, spinulis crebris, brevibus, tenuibus, decussatis, fusco-olivaceis, striatis, acutissime pungentibus; foliis abortivis; stipula minuta, subulata, fusca, ciliata, tuberculoque florifera sub spinula enatis; floribus copiosis, plerumque fasciculatis, rarius solitariis, et proximitate axillarum hinc spicato-congestis; pedunculo hirsuto, incurvo, flore subæquilongo; calycis tubo elongato, cylindrico, infra medium constricto, imo subgloboso, fauce ampliore, limbi laciniis 5 oblongo-ovatis, recurvulis, staminibus intra tubum paulo supra medium insertis, omnino inclusis, filamentis brevissimis, stylo tubo multo brevioris, erecto, stigmate subcapitato, obsolete 3-lobo; fructu pisi magnitudine.—Chile, in Andibus.—*v. s. in herb. Hook.* fluv. Tinguiririca, alt. 3000 ped. (Gillies); Colchagua, in vallibus Andinis (Bridges, 1807); Chile (Gillies, 220); *in herb. Mus. Paris*, San Fernando, prov. Colchagua (Gay, 570).

This is a very distinct species, not only on account of its habit, but of its copious red flowers with an unusually elongated tube, and its included stamens: in all other species the insertion of the stamens is in the mouth, between the segments of the

\* A representation of this plant will be given in the 'Contributions,' pl. 36 D.

border; here they originate far within the tube. Sir W. Hooker, on the authority of Gillies, describes it as being only 1 or 2 feet in height, with decumbent stems; Bridges, on the contrary, says that it grows to the height of 6 or 10 feet, which is more probable. It is found also in Rancagua, where it bears the name of *Cruzero*, appearing as a short tree, with a somewhat slender stem. A decoction is there made from its branches by the natives, who use it as a purgative. It comes into bloom in December and January. The branchlets are straight and terete, the primary spines are  $\frac{1}{4}$  inch apart, generally verticillate, and  $\frac{1}{2}$  inch long; the secondary spines are 4 lines long, and the tertiary spinelets about two lines long, and slender. In the Rancagua specimen, they are somewhat longer and stouter. The flowers are densely aggregated, and cover the spicated branchlets; the pedicel is  $1\frac{1}{2}$  line long; the tube of the calyx is  $3\frac{1}{2}$  lines long, the lanceolate segments 1 line long, and it is 1 line in diameter †.

*Species exclusæ.*

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|---|--|
| 1. <i>Colletia affinis</i> , Clos.      | = <i>Retanilla stricta</i> *.  |
| 2. ——— <i>articulata</i> , Phil.        | = <i>Retanilla articulata</i> *.                                       |
| 3. ——— <i>australis</i> , Brongn.       | = <i>Discaria australis</i> , Hook.                                    |
| 4. ——— <i>Chacaya</i> , Don.            | = <i>Ochetophila 3-nervis</i> , Pöp.                                   |
| 5. ——— <i>crenata</i> , Clos.           | = <i>Notophæna foliosa</i> *.  |
| 6. ——— <i>discolor</i> , Hook.          | = <i>Notophæna discolor</i> *.   |
| 7. ——— <i>disperma</i> , DC.            | = <i>Microrhamnus</i> ?  |
| 8. ——— <i>Doniana</i> , Clos.           | = <i>Ochetophila 3-nervis</i> , Pöp.                                   |
| 9. ——— <i>Ephedra</i> , Vent.           | = <i>Retanilla Ephedra</i> , Brongn.                                   |
| 10. ——— <i>inermis</i> , Clos.          | = <i>Ochetophila 3-nervis</i> .  |
| 11. ——— <i>infesta</i> , Brongn.        | = <i>Adolphia infesta</i> , Meisn.                                     |
| 12. ——— <i>longispina</i> , Hook.       | = <i>Discaria longispina</i> *.  |
| 13. ——— <i>Maytenoides</i> , Griseb.    | = <i>Condalia Maytenoides</i> = <i>Sciadophila Maytenoides</i> , Phil. |
| 14. ——— <i>multiflora</i> , Moç. Sessè. | = <i>Adolphia infesta</i> , Meisn.                                     |
| 15. ——— <i>nana</i> , Clos.             | = <i>Ochetophila prostrata</i> *.                                      |
| 16. ——— <i>obcordata</i> , Vent.        | = <i>Retanilla obcordata</i> , Brongn.                                 |
| 17. ——— <i>pubescens</i> , Brongn.      | = <i>Discaria australis</i> , Hook.                                    |
| 18. ——— <i>serratifolia</i> , Vent.     | = <i>Notophæna serratifolia</i> *.                                     |
| 19. ——— <i>serratifolia</i> , Hook.     | = <i>Notophæna foliosa</i> *.  |
| 20. ——— <i>spicata</i> , Willd.         | = <i>Scypharia senticosa</i> *.  |
| 21. ——— <i>tetragona</i> , Brongn.      | = <i>Scypharia?</i> <i>tetragona</i> *.                                |
| 22. ——— <i>tetrandra</i> , Clos.        | = <i>Trevoa Closiana</i> *.  |
| 23. ——— <i>tomentosa</i> , Phil.        | = <i>Notophæna tomentosa</i> *.  |
| 24. ——— <i>Tralhuén</i> , Bert.         | = <i>Talguenca costata</i> *.  |
| 25. ——— <i>Trebu</i> , Bert.            | = <i>Trevoa 3-nervis</i> *.  |

[To be continued.]

† This species will be shown in the 'Contributions,' plate 36 E.